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09/975,985	10/15/2001	Kim B. Roberts	9-13528-152us	9596

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EXAMINER	
CURS, NATHAN M	
ART UNIT	PAPER NUMBER
2633	

DATE MAILED: 03/07/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/975,985	ROBERTS ET AL.	
	Examiner	Art Unit	
	Nathan Curs	2633	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 January 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3-24 and 26-38* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3-5,8-14,17,19-24,26-28,30-34 and 37* is/are rejected.

7)☒ Claim(s) *6,7,15,16,18,29,35,36 and 38* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *15 October 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1, 3-5, 8, 12-4, 17, 19-21, 24, 26-28, 30, 32-34 and 37 are rejected under 35 U.S.C. 102(e) as being anticipated by Bergano et al. ("Bergano") (US Patent Application Publication No. 2002/0149823).

Regarding claim 1, Bergano discloses a method of measuring a polarization dependent loss/gain (PDL) in an optical communications system including a plurality of optical components, the method comprising: receiving an optical signal at a selected detection point of the optical communications system (figs. 4 and 5 and paragraphs 0035-0040 and 0044), the optical signal having been launched into the optical communications system with a predetermined initial polarization state (figs. 1 and 2 and paragraphs 0026 and 0043); detecting a polarization state of the signal (paragraphs 0026, 0040 and 0042, where detecting the phase modulation of the received signal indicates detecting the change in the polarization state of the signal from it's initial state); and evaluating the PDL using the predetermined initial polarization state and the detected polarization state (paragraphs 0043, 0044 and 0046).

Regarding claim 3, Bergano discloses a method as claimed in claim 1, wherein the optical signal comprises any one of: a data signal; a test signal; and an Amplified Spontaneous Emission (ASE) signal (paragraphs 0025 and 0029)

Regarding claim 4, Bergano discloses a method as claimed in claim 1, wherein the predetermined initial polarization state is substantially time-invariant (paragraph 0043).

Regarding claim 5, Bergano disclose a method as claimed in claim 4, wherein the predetermined initial polarization state comprises a degree of polarization of the optical signal launched into the optical transmission system (paragraph 0026 and 0043, where a predefined "state of polarization" inherently has a "degree of polarization").

Regarding claim 8, Bergano discloses a method as claimed in claim 4, wherein the predetermined initial polarization state comprises respective known initial power levels of orthogonally polarized signal components multiplexed into the optical signal (paragraphs 0026 and 0043).

Regarding claim 12, Bergano discloses a method as claimed in claim 1, wherein the predetermined initial polarization state comprises a predetermined variation of a polarization vector of the optical signal (paragraph 0026).

Regarding claim 13, Bergano discloses a method as claimed in claim 12, wherein the predetermined variation of the polarization vector comprises a rotation of the polarization vector in accordance with a predetermined dither pattern (paragraph 0026).

Regarding claim 14, Bergano discloses a method as claimed in claim 13, wherein the predetermined dither pattern comprises either one or both of: a step-wise rotation of the polarization vector between orthogonal directions; and a small-scale perturbation of a polarization angle of the polarization vector (paragraph 0026).

Regarding claim 17, Bergano discloses a method as claimed in claim 12, wherein the predetermined variation of the polarization vector comprises variation of respective power levels of orthogonally polarized signal components multiplexed into the optical signal, in accordance with respective orthogonal dither patterns (paragraph 0026).

Regarding claim 19, Bergano discloses a system for measuring a polarization dependent loss/gain (PDL) in an optical communications system including a plurality of cascaded optical components, the system comprising: a transmitter adapted to launch an optical signal having a predetermined initial polarization state into the optical communications system (figs. 1 and 2 and paragraphs 0026 and 0043); a polarization state detector adapted to detect a polarization state of the signal at a selected detection point (paragraphs 0026, 0040 and 0042, where detecting the phase modulation of the received signal indicates detecting the change in the polarization state of the signal from it's initial state); and a processor adapted to evaluate the PDL using the predetermined initial polarization state and the detected polarization state (paragraphs 0043, 0044 and 0046).

Regarding claim 20, Bergano discloses a system as claimed in claim 19, wherein the transmitter comprises a polarization rotator adapted to selectively rotate a polarization vector of the optical signal (paragraph 0026).

Regarding claim 21, Bergano discloses a system as claimed in claim 19, wherein the transmitter comprises a controller adapted to selectively vary respective power levels of orthogonal signal components multiplexed into the optical signal, in accordance with respective orthogonal dither patterns (paragraph 0026).

Regarding claim 24, Bergano discloses a network element for measuring a polarization dependent loss/gain (PDL) in an optical communications system including a plurality of optical components, the network element comprising: a receiver adapted to receive an optical signal at

a selected detection point of the optical communications system (figs. 4 and 5 and paragraphs 0035-0040 and 0044), the optical signal having been launched into the optical communications system with a predetermined initial polarization state (figs. 1 and 2 and paragraphs 0026 and 0043); a polarization state detector adapted to detect a polarization state of the signal (paragraphs 0026, 0040 and 0042, where detecting the phase modulation of the received signal indicates detecting the change in the polarization state of the signal from it's initial state); and a processor adapted to evaluate the PDL using the predetermined initial polarization state and the detected polarization state (paragraphs 0043, 0044 and 0046).

Regarding claim 26, Bergano discloses a network element as claimed in claim 24, wherein the optical signal comprises any one of: a data signal; a test signal; and an Amplified Spontaneous Emission (ASE) signal (paragraphs 0025 and 0029).

Regarding claim 27, Bergano discloses a network element as claimed in claim 24, wherein the predetermined initial polarization state is substantially time-invariant (paragraph 0043).

Regarding claim 28, Bergano discloses a network element as claimed in claim 27, wherein the predetermined initial polarization state comprises a degree of polarization of the optical signal launched into the optical transmission system (paragraph 0026 and 0043, where a predefined "state of polarization" inherently has a "degree of polarization").

Regarding claim 30, Bergano discloses a network element as claimed in claim 27, wherein the predetermined initial polarization state comprises respective known initial power levels of orthogonally polarized signal components multiplexed into the optical signal (paragraphs 0026 and 0043).

Regarding claim 32, Bergano discloses a network element as claimed in claim 24, wherein the predetermined initial polarization state comprises a predetermined variation of a polarization vector of the optical signal (paragraph 0026).

Regarding claim 33, Bergano discloses a network element as claimed in claim 32, wherein the predetermined variation of the polarization vector comprises a rotation of the polarization vector in accordance with a predetermined dither pattern (paragraph 0026).

Regarding claim 34, Bergano discloses a network element as claimed in claim 33, wherein the predetermined dither pattern comprises either one or both of: a step-wise rotation of the polarization vector between orthogonal directions; and a small-scale perturbation of a polarization angle of the polarization vector (paragraph 0026).

Regarding claim 37, Bergano discloses a network element as claimed in claim 32, wherein the predetermined variation of the polarization vector comprises variation of respective power levels of orthogonally polarized signal components multiplexed into the optical signal, in accordance with respective orthogonal dither patterns (paragraph 0026).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bergano et al. ("Bergano") (US Patent Application Publication No. 2002/0149823) in view of Marro et al. ("Marro") (US Patent Application Publication No. 2001/052973).

Regarding claim 9, Bergano discloses a method as claimed in claim 8, but does not disclose that the step of detecting the polarization state of the signal comprises a step of detecting respective power levels of each of the orthogonally polarized signal components. However, Marro discloses that the power of each of the two orthogonal polarization modes of a signal define the state of polarization (paragraph 0004). It would have been obvious to one of ordinary skill in the art at the time of the invention to determine the detected polarization state by determining the power levels of the two orthogonal polarization modes of the received signal in the receiver of Bergano, since Marro teaches that this is a conventional way to acquire the polarization state (the detected polarization state to be compared to the initial polarization state in determining PDL).

5. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bergano et al. ("Bergano") (US Patent Application Publication No. 2002/0149823) in view of Marro et al. ("Marro") (US Patent Application Publication No. 2001/052973), as applied to claim 9 above, and further in view of Applicant's admitted prior art (specification, paragraphs 0036 and 0038).

Regarding claim 10, the combination of Bergano and Marro discloses a method as claimed in claim 9, but does not disclose the detector detecting the respective power levels comprising: de-multiplexing each of the orthogonally polarized signal components from the optical signal; and measuring respective eye openings of each of the de-multiplexed signal components. However, the applicant discloses that polarization de-multiplexing the orthogonal signal components of a received signal and measuring the eye openings of each component is conventional for determining the polarization state (specification, paragraph 0038). It would have been obvious to one of ordinary skill in the art at the time of the invention that the eye openings of the demultiplexed orthogonal signal components could be measured to determine

the levels of the orthogonal signal components that define the detected polarization state, since this is a conventional measurement technique, as disclosed by the Applicant.

6. Claims 11, 22, 23 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over over Bergano et al. ("Bergano") (US Patent Application Publication No. 2002/0149823) in view of Applicant's admitted prior art (specification, paragraphs 0036 and 0038).

Regarding claim 11, Bergano discloses a method as claimed in claim 1, and discloses determining the detected polarization state for comparison to the initial polarization state to evaluate PDL, but does not explicitly disclose a step of calculating a vector difference between the detected polarization state and the initial polarization state. However, the Applicant discloses that representing a polarization state as a vector quantity, based on the levels of the orthogonally polarized signal components, is conventional (specification, paragraph 0036). It would have been obvious to one of ordinary skill in the art at the time of the invention to represent the disclosed polarization states of Bergano as a vectors, and thus comparing polarization states by calculating a vector difference, since vector representations of polarization states is conventional, as disclosed by the Applicant.

Regarding claim 22, Bergano discloses a system as claimed in claim 19, but does not disclose that the detector comprises: a beam splitter adapted to split the optical signal into respective orthogonally polarized beams; and means for detecting respective power levels of each of the orthogonally polarized beams. However, the applicant discloses that beam splitting the orthogonal signal components of a received signal and measuring the power of each component is conventional for determining the polarization state (specification, paragraph 0036). It would have been obvious to one of ordinary skill in the art at the time of the invention to split orthogonal signal components to determine the power levels of the orthogonal signal

components that define the detected polarization state, since this is a conventional measurement technique, as disclosed by the Applicant.

Regarding claims 23 and 31, Bergano discloses a system and network element as claimed in claims 19 and 30, respectively, but does not disclose the detector detecting the respective power levels comprising: de-multiplexing each of the orthogonally polarized signal components from the optical signal; and measuring respective eye openings of each of the de-multiplexed signal components. However, the applicant discloses that polarization de-multiplexing the orthogonal signal components of a received signal and measuring the eye openings of each component is conventional for determining the polarization state (specification, paragraph 0038). It would have been obvious to one of ordinary skill in the art at the time of the invention that the eye openings of the demultiplexed orthogonal signal components could be measured to determine the levels of the orthogonal signal components that define the detected polarization state, since this is a conventional measurement technique, as disclosed by the Applicant.

Allowable Subject Matter

7. Claims 6, 7, 15, 16, 18, 29, 35, 36 and 38 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

8. Applicant's arguments filed 11 January 2006 have been fully considered but they are not persuasive.

Regarding rejections under 102(e), the applicant argues that Bergano only teaches a single detector for amplitude detection and that one of ordinary skill in the art would recognize that the receiver does not attempt to measure the polarization state. However, Bergano discloses that PDL is indicated by an amplitude modulation between polarization states P1 and P2 in the received signal (paragraph 0033). Considering that the polarization state of the transmit signal is defined by switching between **either** polarization state P1 **or** polarization state P2 (see fig. 3c), the amplitude detection at the receiver for comparison with the transmit signal is effectively detection of one of the two polarization states at any given time. Therefore, in contrast to the applicant's argument, the detected signal does contain information about polarization angle, in light of the corresponding polarization angle of the transmit signal. If the level of the receive signal is less than the transmit level for a window of time corresponding to a transmitted P1 state, this is information that loss has been experienced at the P1 state. After similar information is acquired for the P2 state, a determination of PDL can be made.

Conclusion

9. Any inquiry concerning this communication from the examiner should be directed to N. Curs whose telephone number is (571) 272-3028. The examiner can normally be reached on M-F (from 9 AM to 5 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan, can be reached at (571) 272-3022. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (800) 786-9199.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pairdirect.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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